NON-DESTRUCTIVE ANALYSIS AND TESTING OF MUSEUM OBJECTS: AN OVERVIEW OF 5 YEARS OF RESEARCH WITHIN COST ACTION G8

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ABSTRACT

This paper gives an overview of research performed within the pan-European network COST Action G8. COST is an intergovernmental European framework that allows the coordination of nationally funded research at a Europe-wide level. COST activities are based on so-called Actions which are networks on a specific topic covering basic and pre-competitive research. Action G8, which ended in 2006, one of these networks and had 24 member countries. Its objective was to achieve a better preservation and conservation of European (and related) cultural heritage by increasing our knowledge of art and archaeological objects through chemical and physical analyses. To achieve this, Action G8 created an intra-European environment, in which people directly concerned with the maintenance of our cultural heritage (i.e. art historians, archaeologists, conservators and curators) and analytical scientists (i.e. physicists, chemists, material scientists, geologists, etc.) could exchange knowledge.

SCIENTIFIC PROGRAMME

COST Action G8 had three main scientific activities. The first one included organizing short-term scientific missions (STSMs) between participating institutions. The goal of these STSMs (5 days – 3 months) involved the training of scientists from both professional groups in the other's field, as well as the transfer of practical experience among European countries. Priority here was especially given to young researchers.

Secondly, regular meetings in the form of workshops and training schools were organized, often in collaboration with museums and conservation institutes, to exchange obtained information in a broader group, to discuss new themes, and to build interest and create possibilities for new collaborations.

In order to allow an easier coordination of these activities, six separate working groups were created within COST G8. They also provided a basis for a close collaboration and an efficient exchange of knowledge within a specific topic. In what follows a brief description is given on the goals and activities of the COST G8 working groups.

- Technology and authenticity, involving the identification of the materials and their production techniques. Within this working group two distinct but related topics were studied: (1) the investigation and verification of ancient recipes starting from the Mesopotamian and Egyptian texts up to the 19th century books of technology including descriptions of how craftsmen prepared and made their products are made available and (2) the authentication of art and archaeological objects, i.e. the identification of fakes.
- Origin and provenance, including the characterisation and location of natural sources of the raw materials used to make (museum) objects. The main goal was to contribute to establishing patterns of raw material procurement, trade or exchange.
- Degradation processes, corrosion, weathering. This working group dealt with the problem of alteration of museum objects and the way non-destructive techniques can be used to measure this damage or monitor it with time.
- Preservation and conservation. The working group was concerned with the treatment of works of art in order to slow down deterioration, the identification of the nature and extent of damage, the assessment of the causes of deterioration. Work in this field also implies the

control of the environment in which the object is located, such as monitoring of the temperature, relative humidity and lighting, ensuring proper storage, support and security.

- Development of analysis procedures involving three main goals: (1) the use and improvement of truly non-invasive techniques (they do not require a sample to be removed from the object), (2) the maximization of information and minimization of consumed volume when a sample must be removed and (3) the development of portable / mobile equipment so that monitoring can be done on site.
- Biological and Material Culture of Qumran at the Dead Sea. This working group dealt with three aspects of the study of material remains at Qumran, i.e. the biological and the material cultural ones and the conservation of this cultural heritage.

The networking has led to a vast number of scientific publications. The monographs amongst them are listed in the references.

FUTURE ACTIVITIES

There is no doubt that the Action has strengthened the multidisciplinary community in this field. It has enhanced the capability for answering questions related to museum objects, which could not readily be solved, and the exchange of knowledge in both directions. Moreover Action G8 has provided museums and similar institutes easy access to universities and research facilities that have the required analytical techniques and related expertise available.

Nevertheless the situation is still capable of improvement. The multidisciplinary community of action remains essential, as in the current economic climate it is extremely difficult for museums to develop new analytical methods or techniques. The need for collaboration with experts in state-of-the art analytical instrumentation is therefore very high and can tap-in to sources of knowledge and sophistication of equipment, which would otherwise be impossible in the small conservation and science groups in museums.

Apart from the unquestionable need to strengthen further the teamwork, one of the aims for the future could be the development of critical pathways through the various analytical techniques in order to maximize the information from minimal sample handling and consumption. In other words a synergistic combination of techniques which is matched to the problem at hand is required to advance the knowledge required to convert a decaying museum artefact into a protected and informative public display.

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